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COVER: Often a pest and a nuisance where field crop or garden is within easy ambling distance of his burrow, the ubiquitous woodchuck is also prized "summer game" for the rifleman, and an alert quarry and difficult target he surely is. Our artist: Kent Pendleton, Bellevue, Washington.

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GUEST EDITORIAL

The Lure of Fishing

By ELLIS M. TUSING

Broadway

"FISHING fever," as it is sometimes called, is like a disease that seems incurable, incurable to all of us that it has lured away from our comfortable homes before dawn, a fever so engrossing that it can make us wade the streams and rivers in the still icy spring waters, as old Mother Nature starts her unfolding of another fishing season.

It seems as though by the time spring rolls around last year's fishing tales have been told and re-told again and again, thus increasing our anxiety to hit the rivers and streams anew, in our conquest of the water's inhahitants—inhahitants that Mother Nature has preserved and nurtured all winter long, while we have been sitting beside the fireplace readying our tackle for the opening season. By the time spring arrives once again, last year seems far removed, as the prospect of more excitement and sheer enjoyment are anticipated with "opening day" approaching.

News has a way of filtering around the eager anglers, as to the favorite spots of all for bass, trout, perch and news of stocking spots, dates, times, numbers and sizes that will be stocked. As opening day approaches the avid angler has compiled a mental portfolio of all the data possible. It is like a case of espionage or surveillance as to who can get the most useful information possible; and then when the hig day arrives, he will try to assemble all that he has learned and planned for all winter long, pick up his tackle and head out, filled with exuberant fishing excitement, actually tense with the lure of one of Mother Nature's most enjoyable sports.

Fishermen are a special group all their own: a group that enjoys gathering around a campfire and telling of the "big one" that got away, telling of the fight that the trophy sized trout gave them, reminiscing of the fresh mountain stream where he caught his limit, or where he saw a mother deer and her fawn drinking from the coolness of a mountain pool.

These pleasant experiences are a part of the "lure" that fishing offers aside from the peaceful serenity of the sport.

A chance to get out in the woods in the early morning and watch as the sun rises up and filters down through the trees and the quiet mist floats up from the secluded streams, as the water rustles over the damp rocks. This quiet serenity offers as much as the catching of a trophy size game fish. A chance to get away from the busy everyday activities that we encounter in our lives and retreat with Mother Nature as she brings forth another day, painted in all her majesty, that only can be perceived by being a part of it.

With every spare moment we are there every day possible from the first day of the season in the spring until the last day—all the while enjoying every minute of fishing experience as only a fisherman can do. And when once again the season draws to a close the avid angler will start preparing for another fishing season, to be filled with excitement and all the challenges that the sport offers. Fishing is truly an incurable disease.

LETTERS

Comments on Ecology

THIS letter is in response to the recent article "Ecology: Next Big Domestic Issue," by Bill Weekes which appeared in the May issue of *Virginia Wildlife*. I agree with several ideas expressed in the article: man is the only animal that can eliminate prey species; man seems insulted if there remains an unspoiled landscape; man has the capacity to destroy earth; and finally but most important, man's attitude must change if he is to survive.

Man has the attitude that everything is for his exploitation and that he is not a part of the ecological system (ecosystem) of "spaceship earth." His egocentricity and narrow-mindedness has led to the ecological crises that now confront the planet. If man could but understand all of the implications of his activities, he would probably reconsider the majority of them.

However, I do disagree slightly with three ideas or facts expressed in the article:

(1) Ecology is not only the animal kingdom's relationship to the environment. Correctly defined, ecology is the relationship of any living organism to its environment. This definition includes both the plant and animal kingdoms as plants as well as animals are living organisms. Certainly in the ecosystem, plants are at least as important as animals, perhaps more important since the basic food chains and webs begin with plants. If the plants necessary to maintain a given animal are destroyed by chemicals (2,4-D, 2,4,5-T) or bulldozers, part of a food chain is destroyed. Meat-eating animals that feed on plant-eating animals are also destroyed. (Because of these relationships, man's detrimental effect on animal life can often be indirect and insidious). Therefore, an ecosystem cannot exist without both plants and animals and any general definition of ecology must include both.

(2) In the last 290 years, over 231 species of birds have been eliminated or become extinct; some 40 species are known only through museum specimens. On the average, one bird species per year has been eliminated for the last 290 years. If this indication that our ecosystem is being destroyed does not jar non-conservationists (and perhaps a few conservationists) out of their worldly security, then man too is a lost species.

(3) Let's make ecology a way of life, not just a domestic issue. Can it be any other way with the number of people expected to be living on earth by the year 2000?

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TODAY'S YOUTH:

Text and Photos by WILLIAM D. WEEKES
Martinsville

ENVIRONMENT'S PIVOTAL GENERATION

THE first Earth Day is gone and the nation waits for the other shoe to fall—civic and legal action against pollutants, an upsurge of research and educational projects directed toward saving America's environmental face.

If anything, April 22's Earth Day demonstrated the concern of America's youth over the degradation of our great outdoors by pollution and its twin—the booming population.

In bands, representing more than 1,000 colleges and 2,500 high schools, students peaceably demonstrated their awareness of the problem.

Signs were prevalent: "If You Are Not Part Of The Solution, You Are Part Of The Pollution," "Where Have All The Flowers Gone?" "The Population Bomb Keeps Ticking," "Don't Air Your Problems, Filter Them," "Re-cycle Resources."

The young people wore gas or gauze masks to emphasize the apocalyptic nature of air pollution. In some areas, young people held "bike-ins," stacked trash on municipal building steps or non-returnable bottles in front of soft-drink establishments. Students in other locales rode horses or roller skated to school, leaving their cars home. Sunrise services were held at Madison, Wisconsin, and Northhampton, Massachusetts. Prayers of forgiveness were emitted by students for man's despoiling of the earth. Coffins were carried as pollution floats, internal combustion engines were buried and in San Francisco students, demonstrating the need for the comeback of the returnable bottle, poured milk into vacuum bottles at stores and handed back the empty cartons to the proprietors. At Coyote Point, San Mateo, California, young volunteers from many conservation groups helped clean away sludgy areas along the coast.

It was a day of indoctrination. Youth were exposed to the ramifications of the pollution problem. Everything from oil spills on our coast lines to pesticide damage to birds was discussed in teach-ins.

"This generation of youth is vitally concerned about environment, because it will inherit the disaster of wanton, indifferent waste and destruction of the natural resources of the country," stated Gaylord Nelson of Wisconsin, the U.S. senator who last January introduced an amendment to the Constitution that would, if passed by three-fourths of the states' legislatures, guarantee each American citizen an inalienable right to a decent environment.

"Today youth is the vanguard working for change in our society," stated outspoken Walter J. Hickel, Secretary of the Interior.

Why the youth? Is today's generation of teenagers and early 20-year-olds to be the pivotal generation that will have to work to save the quality of our living space? There are more sub-25-year-olds today than ever before. As an activist group they have a number of things going for them—a comparatively uncomplicated life that would permit them the time to organize for political action; a built-in esprit de corps based on fewness of years and welled together by common cause; a sense of being masters of their own feeling, yet unaccountable for their ideas and actions to any status quo Big Brother employer; emotional enthusiasm engendered by good health and physical drive; sensitivity to new ideas because their young minds have not yet been fettered by set attitudes and prejudices. In short, youth can afford to be sincere.

Exactly what is at stake can be estimated by glancing at an ecological timetable. What problems may today's youth expect to confront as they become older decision-making adults? Here are some of the ominous prospects:

1—If the population rate continues at its present rate, there will be between six and eight billion people on earth by 2,000 A.D. In the U.S., there will be 300 million persons. How and where are they to be fed, housed and clothed?

2—According to Dr. S. Dillon Ripley, secretary of the Smithsonian Institution, between 75 and 80 percent of the existing species on earth will be extinct in 25 years. How will this lost heritage affect the sanity of a pressured populace hungry for the solace of pristine oases?

3—Some 140 billion tons of carbon dioxide, soot and other contaminants invade the world's atmosphere each year from industrial waste and automobile use, all of which in 30 years may either increase the earth's temperature (through the greenhouse effect of carbon dioxide) and start melting of polar caps that will eventually cause flood, earthquakes and other disasters—or the soot particles will have become so dense as to shut out the sun's heat rays and cause the emergence of a new ice age upon the earth. How can we defend ourselves?

4—Americans are the greatest polluters of the seas—some 889 billion gallons of wastes, pesticides and radionuclides EACH DAY going into our water systems. Where will we be in 20 or 30 years when all the marine life has died off? What will we eat?

So here we sit. Is it any wonder, with these ecological tragedies facing them, young people would want to head off as much of the problem as possible? Is it any wonder they feel cheated, feel some resentment at being left holding the bag by the ignorant, mindless and apparently indifferent assaults on our environment of their predecessors? Is it any wonder they seek a different set of values over those that have resulted in practices proven by now to be ecologically disastrous?

It is the youth who are (and should be) the most aware of society's injustices and foibles. Pre-conditioned from the cradle to believe certain values, they will naturally be the most prone to rebel when their maturing minds discern the flaws and inconsistencies resulting from the established generation's ways of doing things. The parents want the best of all possible worlds for their offspring, which means financial security and a niche in a social scale. The kids may see things that are important to settle along the way, a world of beauty to preserve, one big enough to house diverse flora and fauna and healthy enough to breathe, drink, swim and

April 22, 1970, demonstrated American youth's concern over pollution and its twin, the booming population.

surf in. If one can't enjoy the world one lives in, then what good is financial security?

If there be any group who will reject the old values or at least modify them, it will have to be the youth. And because they will be THINKING things differently, they will be DOING things differently. This is not to say the older generation cannot and is not accessible to the idea of change. Quite the contrary; this problem of environmental survival may well be the hub around which the generation gaps will be closed.

However, the young people, because there are more of them, because they are not fettered by habitual ways of thinking, will have to be in the forefront of those who will formulate new ecological doctrines and codes; who will have to petition and lobby politicians to get on the ball with relevant laws; will have to be on the lookout and expose industries usurping the environment.

New codes and mores will have to be developed based on a different point of view . . . "for this generation of students, like no other in my lifetime," stated ecologist John Fischer, "is hungering and thirsting after righteousness. What it wants is a moral system it can believe in."

Some of the battlegrounds of new outlooks will have to fall in the following areas:

First, because the world is not as big as it used to be—that is, because there are more people and because resources and space for waste are becoming more and more limited on this "spaceship"—big cannot any longer be considered best; busy cannot necessarily be beneficial; industrial expansion and too many children in one family can now be considered evils (not retroactively, however). Therefore, economic advancement, when it interferes with the good will of the environment, can now be declared wrong, an immoral act. If industry comes back with the argument that expansion increases jobs, the answer is that if the jobs threaten the environment, they should be considered "criminal occupations."

Better there be alternative jobs created, ecologically directed occupations developed. There is a deep need for more technically trained personnel to oversee our lands. Other possibilities are nursery and habitat specialists, cleanup corps, more researchers in the fields of pest eradication through biological means, and in oceanography. It is not a matter of jobs, but what kind of jobs; not of manufacturing, but in what, where and how the product is being made.

It is a matter also of priorities. Like balladeer Pat Seeger, many young people are wondering why we should be "standing knee deep in garbage, throwing rocks at the moon."

If there be any group who can help keep down the population boom, it is (and WILL have to be) America's youth. Taxation or other financial penalty, or sterilization decrees, may become society's last resort to making couples obey proper family planning practices. Having too many children (more than two) may soon be looked upon as a vain, greedy and criminal act. Status may be converted to how one practices self restraint in these matters. Even today, a certain notoriety befell one Stephanie Mills when she declared in her valedictory speech at Mills College, Oakland, California, that the most humane thing she could do for the world would be not to have children.

Second, because expansion of industry is the result of, or promise of, more goods in the future, it would be right and proper to discourage such optimism. The only way to do this is for individuals to begin curbing their wants, realign their thoughts on what are necessities, limit the things one "simply must have" to keep up with the Joneses. The less number of things we think we need, the less number of things we buy and the less dependent on things we become.

(Continued on page 22)

Worm Fishing's New Techniques

By BILL COCHRAN
Roanoke

WHAT are the bass hitting?

Next time someone asks you that, or you ask the question yourself, chances are the answer will be plastic worms. Of all the hundreds of lures which over the years have been tossed at bass, none has made the impact—has caught the fish—that the plastic worm has.

During the first two annual Smith Mountain Lake Fishing Tournaments, held in early May, more bass entered were caught on plastic worms than on all other lures and baits combined. That's enough to make an angler forget all other lures and fish only with worms. Fact is, some topflight fishermen have just about done that. Worms are one of the few lures you can rely upon all year long, even during the hot dog days of summer.

Back in the August, 1968, issue of *Virginia Wildlife*, I wrote, "The plastic worm is truly one of the most effective lures ever devised." The truth of that statement hasn't changed one bit. What has changed since that date, though, is the way worms are being rigged and fished. Experienced bass fishermen recently have devised some very definite new ideas about what tackle is best for worms, what rigging method is most productive, and what fishing technique pays off most often. That's what this article is all about. It is a new look at worm fishing.

First, the rod being used by the serious worm fisherman more and more often is a heavy-butted, fairly short bait casting rod. Some are so hefty you almost could use them as walking sticks. A name given one make, for example, is Mule Stick, and that describes it very well.

Onto these outfits go monofilament line of 15 to 25 pound test, unless the water is extremely clear—then lighter may be used. Gone, for the most part, is the sporty 8 to 10 pound test of a couple years ago. The heavy line serves two purposes. Principally, its extra strength is needed when you horse back on one of those heavy-butted rods in order to sock the hook into the fish. It also acts as a telegraph line which more easily relates, because of its stiffness, the thump a bass makes when he takes the lure into his mouth.

Something else new evolving among the serious worm fisherman is how the worm is handled once a fish takes it into his mouth. Time was when most anglers let the bass have the worm and run with it, sometimes almost into the next county, before striking. Now, a growing number of fishermen strike—and strike hard—at the first hint that a bass might be mouthing their offering. When a bass sucks in a worm, he creates a vacuum which causes the worm to hop a couple inches. This, in turn, causes a little snap or movement in your line which you can see if you closely watch for it. If you strike on a visible sign, chances are much better that you are going to hook the bass than if you wait until you feel him tugging on your worm. If there is a gentle twitch or bump or if the line suddenly acts abnormal, most experienced worm fishermen now will set the

A new and important method for rigging a plastic worm has evolved. First the hook is inserted into the nose of the worm . . .

. . . then the point is brought out . . .

. . . and the worm is worked up the shank of the hook so the point and barb can be buried in the body of the worm.

With point and barb of hook buried, a toothpick is pushed through the head of the worm and through the eye of the hook.

The toothpick is clipped off . . .

. . . and the worm is ready to cast.

hook immediately. Indeed, they set it with such vigor the entire boat often will rock.

Why do they strike so hard? First, because speed is necessary to send the hook home before the bass discovers something fake about the worm and ejects it, which he can do in a split second. Secondly, because, as will be explained later, the worm is rigged in such a way that the point of the hook is buried into the body of the worm. It, then, requires the force of a hefty strike to drive the hook through the worm and into the tough jaw of a bass. Not only that, when a bass takes a worm into his mouth, he tends to ball it up, and a light strike may simply pull the ball out of his mouth while a heavy one is more apt to send the hook into the bass.

The need for heavy tackle goes beyond the strike. A stout rod and stiff line will allow you to reel a bass more rapidly up out of the brush and other obstructions where most likely he will be found. Get him in fast, is the new goal. You can play with him once he's safely in the bottom of the boat.

Now, about the new, and important, method for rigging a worm which has evolved out of the Deep South and found its way into Virginia waters. First, onto the line goes what is called a slip sinker. Some bullet shaped sinkers with a hole down their middle are being made especially for this. I've found these to be most handy, but you can make your own by cutting an egg sinker in half or by removing the wire from a bell sinker. The small end of the sinker is threaded onto the line first.

The sinker, of course, is necessary to get the worm down to where the bass are staying. But the value of a sliding sinker goes beyond this. Situated at the nose of the worm, it protects the soft plastic from being damaged by underwater snags. More important, when a bass picks up the worm the sliding sinker will give out line without warning the fish as the dead weight of a fixed sinker often will. When the bass is hooked, the sinker normally slides up the line a way, prohibiting the fish from using it as leverage when he leaps out of the water.

After the sliding sinker is threaded onto the line, a hook (see pictures), generally a big taut 4/0 or 5/0, is tied on. These are really big hooks, and when you sink one into the jaw of a fish, it will hold.

The point of the hook, which should be needle sharp, is threaded straight into the nose of the worm for about one-third of an inch, then brought back out the side of the worm. The body of the worm is worked up the shank of the hook until the eye of the hook is buried in the nose of the worm. Then the point and barb of the hook is embedded into the body of the worm, making the hook weedless. It is important that the hook leave no bend in the body of the worm, because if it does the worm will spin when retrieved, causing a twist in your line.

In the final step, a toothpick, one of the rounded, stout size, is pushed through the head of the worm, down through the eye of the hook and clipped off with pliers or nail clippers on both ends. This holds the worm secure to the hook, preventing it from sliding along the shank which will cause it to rip. The whole thing can be done in about 30 seconds' time.

There are two basic schools of thought about how a worm should be fished. Some anglers will work one much like you would a popping bug. They cast it to within inches of the bank, flicking it at the stumps, the tree roots, the rocks and the other obstructions—places a big old bass might be sitting, fanning his gills just waiting for something to come along.

(Continued on page 21)

SONG of the Cicada

By ROBERT PROCTOR
Bethesda, Maryland

THEY came in the space of a night or two, up from the awakening earth. In the dark they swarmed through the dew-damp grass and skittered across the flagstone walk. It was spring, 1970, and the drive to the trees was on.

By morning they were gone, or so it seemed. Only the vacant, split-backed shells, clinging as if glued to the tree trunks in the yard, scattered in the dirt along the picket fence, betrayed the invaders in the branches above . . . until, with the warming day, the droning began. After 17 years, Brood X of the periodic cicada had returned to the Old Dominion.

But only for a little while, a few short weeks. . . . It's far into the summer, now, and, save for a few stragglers, Brood X has departed. Yet, along the dusty limbs, overhead, the melancholy whirring continues. Listen . . . can you hear it? Now it rises to a whine on the still, hot air; now it fades to silence before a passing wind. A newcomer, the harvest fly, has taken up the summertime song of the cicada.

Mention the word "cicada" to most folks and, chances are, they'll tell you that the cicada appears every 17 years. They'll be right, too, but only up to a point. Between one and two inches in length and, in appearance, rather like an oversized, red-trimmed horsefly, with oversized, transparent wings, the *periodic* cicada does, indeed, show up every 17 years. And because his arrival can be so dramatic, his stay so raucous, he's by far the best known cicada going. Some people call him the 17-year locust.

Regardless of his name or his reputation, however, the periodic cicada is not the *only* cicada going, nor can he and the rest of his big-winged kind be written off for 17 years at a clip. The family *Cicadidae* is not so easily catalogued.

There are, in fact, lots of different kinds of cicadas—over 2,000 known species throughout the world, roughly 200 in the United States and Canada, alone. Just three of these species are of the 17-year, or periodic, variety. They occur across the eastern half of the country, including Virginia, in widely scattered bands that entomologists have labeled "broods" and number one to seventeen. Some of these broods are small and hardly worth watching; others are enormous beyond belief.

Brood X, for instance, is easily the largest and most widespread of all the broods. As such, it includes all three 17-year species, in uncountable numbers. It was Brood X, of course, that popped up this past spring. If nature holds to her present course, the tack that she has taken for centuries, this brood will show again in 1987. In the meantime, though, the next appearance of the second largest group, Brood XIV, is scheduled for the spring of 1974.

And so it goes. The thing about periodic cicada broods is that, large or small, they pop up in different years in different places. And if you crank into this jack-in-the-box scheme the smaller bands that, through the years, have gone out of cycle with their broods, the laggards and early bugs within these bands, the three species of a *13-year* cicada in the southeastern part of the country, and the roughly 190 remaining species, all with life cycles that vary in length . . . you can begin to see why the cicada's song is such a familiar part of every summer.

Cicada has great, broad head, protruding eyes, and two pair of wings, the fore pair long and powerful and forming a transparent tent over much of the insect's body when at rest.

Dog-day cicadas, or harvest flies, are the ferocious-looking bugs that inhabit the leaf-bearing trees in your neighborhood each year, beginning in mid-summer. A basic green in color, with great, broad heads, dark, protruding eyes and two pairs of black-veined, transparent wings that lock together in flight for extra thrust, these common cicadas reach a whopping length of two inches or more at maturity. Thus, while they resemble their 17-year cousins in body structure, they nevertheless differ in three major respects: they're darker in color, superior in size and, of course, their life cycle is considerably shorter, usually two to five years. Differences aside, though, all cicada species can be thought of as "periodic," because each requires this period of several years to reach maturity. And what a strange several-year period it is!

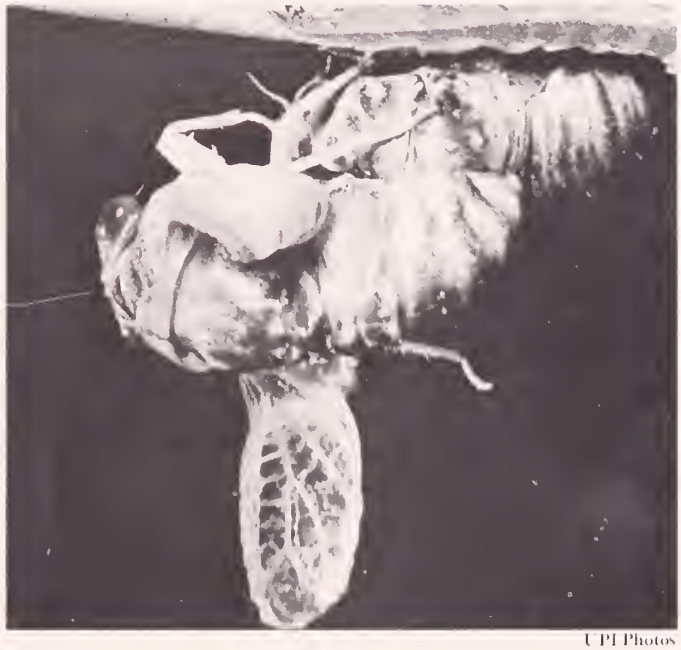
Female cicadas lay their eggs in summer in the twigs and branches of deciduous trees. Wielding their strong, sharp ovipositors, or egg-laying tubes, like miniature seed-planters, they inch along the tender limbs, at once slitting the bark and depositing in each slit from 3 to 15 eggs. Not uncom-

mouly, a single cicada will leave behind her over 100 eggs in more than two dozen incisions.

If such feats are necessary to the procreation of the cicada, they're also of real concern to fruit growers and nurserymen, for, in the brood years, when cicadas are numerous, their egg-laying activities can damage young trees severely. In all fairness to the family *Cicadidae*, however, it should be noted that its members are in no way related to the ravenous locust (*Locustidae*) and that egg-laying is the cicada's sole destructive practice. To boot, many naturalists take a mild view of even this function, dubbing it simply another way in which nature prunes trees.

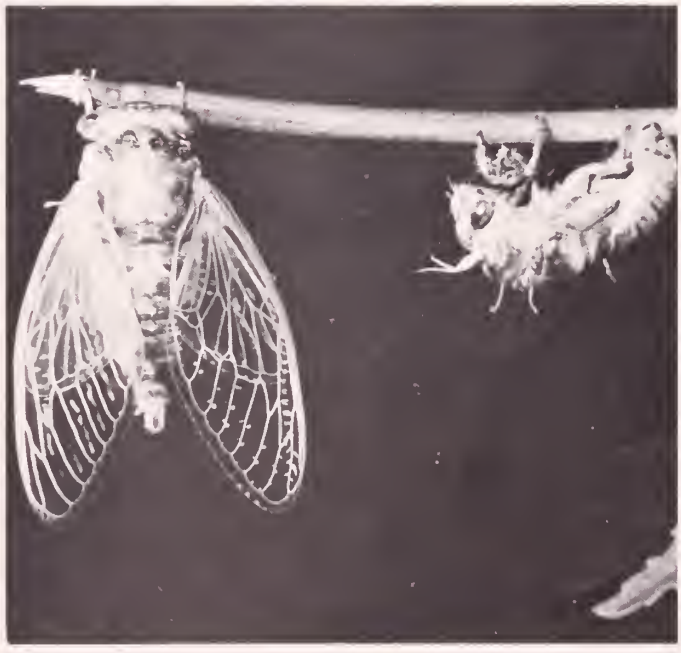
When the cicada eggs hatch, the young tumble from their lofty nests to the ground and immediately begin to burrow, heading for the tender roots of the trees. Here, among these roots, they will spend up to 17 years, the nymphal years, sucking the nourishing juices and growing very, very slowly.

In the spring or early summer of their emergence year, the nymphs stop feeding and, as if on cue, begin to move upward. By now, their front legs are enlarged for digging and equipped with rearward-pointing spines. Manipulated pincer-fashion, like tiny backhoes, these instruments propel their operators up through the earth until they arrive, one after another, just beneath the surface. Here, the nymphs pause, sometimes for weeks, waiting for a signal that no man entirely understands. Then, suddenly—always at night and often in the space of a single night—the moment arrives. They emerge.



UPI Photos

Upper left: Adult cicada begins to squirm free of its nymph shell. Upper right: Emergence proceeds as cicada maneuvers for a grip on twig. Lower left: Completely emerged cicada clings to twig as wings begin to unfold. Lower right: After two hours of hanging in this position fully developed cicada is nearly ready for flight.



And just in time, too, for when a cicada nymph finally scrambles from its tunnel, its shell is close to the point of cracking, and it must quickly find a secure spot for the molting, or shedding, that is about to take place. Frantically, the nymph clambers about, searching for an upright object. Arriving at the base of a tree, it climbs part way up, then halts and takes a desperate grip on a chunk of bark or pro-

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Wildlife in the James River Basin

By C. H. SHAFFER
Game Management Field Coordinator

Photos by Leonard Lee Rue, III

IT is unfortunate that the majestic and historic James River has been getting a bad press during the past year. First came the disastrous floods in August when its angry waters swept through the entire length of the watershed, carrying with it people, homes, bridges, livestock, crops and soil. Soon thereafter the mighty James River again hit the headlines with the controversy over Richmond's sewage disposal plans. In this article we will attempt a change of pace, from the flood and pollution issues to wildlife management in Virginia's heartland watershed. The James River is not all bad!

The James River Basin region encompasses 32 counties, over 25 percent of Virginia's land area, and almost half of its human population.

The wildlife resources of the James River Basin are very important recreationally, economically, and aesthetically. This region, stretching from the mountains through the Piedmont to the Tidewater, naturally offers a variety of wildlife because of the many habitat types. It is one of the most productive regions of the state for favorite species of game. Hunting is a popular form of outdoor recreation, with an estimated 200,000 Virginians participating in this sport in the Basin. Fishing, boating, camping and other recreational activities are also important but will not be stressed here.

Fifty-seven per cent of Virginia's bear harvest comes from the James River basin.

The James River basin contributes 65% of the fall turkey kill and nearly half of the spring gobblers.

A large amount of land in this region is managed exclusively for wildlife. In recent years the Commission of Game & Inland Fisheries has purchased a total of 78,346 acres in the Basin in an attempt to meet the growing needs for public hunting areas. These areas include the following wildlife management areas: Amelia, Gathright, Goshen, Highland, Hog Island, James River, Little North Mountain, and Powhatan.

In this region cooperative agreements to manage wildlife resources have been enacted on the George Washington and Jefferson National Forests, the Virginia State Forests, the Lee Experimental Forest, and on Camp Pickett. In addition, a number of progressive industries have opened their lands to public hunting either through cooperative agreements or through annual permits to individual sportsmen. Numerous landowners lease their hunting rights to sportsmen's clubs or to individuals.

Favorite wildlife species include deer, bear, turkeys, grouse, quail, fox, raccoon, rabbits, squirrels, dove and waterfowl. Virginia hunters are required to check their big game at local hunter contact stations; thus, harvest figures can be accumulated annually. An analysis of the 1969-70 harvest data indicates the significance of the James River Basin for wildlife production and for recreation. Hunters collected 158 bear (57 percent of the State-wide kill), 2,973 turkeys in the fall (65 percent of kill) and 672 during the spring gobbler season (47 percent of kill), and 15,453 deer which represented 15 percent of the State-wide harvest (see attached chart).

Deer populations are good to excellent in all of the counties of the James River Basin, with perhaps 150,000 animals living in various types of habitat. Bear can be found in the mountain habitat of the Appalachians and Blue Ridge. Turkeys are abundant in the mountainous region of the Basin, but in the Piedmont they are gradually decreasing as more natural habitat is destroyed and in the eastern counties this huge game bird is now practically extinct. Grouse are ordinarily associated with the mountain ranges, but in

recent years huntable populations are developing in certain Piedmont areas. Quail, doves, rabbits, and squirrels can be found in good numbers throughout the Basin, but ordinarily the areas east of the Blue Ridge produce the most farm game birds and animals. Waterfowl hunting becomes more important in the eastern Tidewater Counties. However, the James River itself and a number of its upper tributaries provide some jump shooting for duck hunters.

Other game species which provide thousands of days and nights of outdoor recreation to Virginia sportsmen include fox, raccoon and opossum. Trapping is likewise important on the James River watershed, where muskrat, beaver, mink and otter abound.

Current and future wildlife problems in the James River Basin revolve around people, their land use practices and the resulting effect on habitat for all species of game. Experts are unanimous in their forecasts that human population explosions will continue into the future. Evidence of this human expansion can be readily observed in the regions around Covington, Lynchburg, Richmond, Petersburg and the eastern megalopolis region. There are approximately 400,000 Virginians now obtaining outdoor recreation

Some of the most successful pheasant releases have been along the James, and hunters in the lower basin are expected to find some of these gaudy exotics during the special two day season this fall.

through hunting. Over the past decade there has not been a significantly large increase in number of such sportsmen. However, detrimental or competitive (to wildlife) land use treatments have reduced the number of acres where wildlife can be produced and areas where hunters can practice their sport. Thus, in effect, we have less acres for more sportsmen. This trend will doubtless continue indefinitely.

Increased human populations, even though they may not compete directly with sportsmen, produce numerous problems for wildlife managers, not only along the James River but throughout the entire state. They litter management areas; their pets are often serious predators on wildlife populations; they poach, pollute, shoot up signs and destroy wildlife habitat through carelessness.

Other land use treatments often inadvertently reduce wildlife habitat even though they may be wise conservation practices. To survive and reproduce, wildlife populations need undisturbed habitat with an abundance of natural or planted food and cover. Clean farming, drainage, increased beef cattle production, and the retirement of cropland all have an adverse effect on certain species of wildlife. During the past decade there has been a trend by public and private holdings of large tracts of timber to convert from hardwoods to pine trees. These activities, and 75,000 acres are being treated annually, have a profound effect on plant ecology and game food and cover.

Wildlife habitat is further being reduced by the human needs for space for highways, cities, factories, shopping centers, and by large water impoundments for industry and water supply.

Unfortunately, wildlife has always been, and will continue to be, a by-product of other land use practices. In the future, wildlife populations must adapt to changing patterns or they will not survive.

There is still another complicating factor involved with increased human populations and their land and water requirements. The great demand for land from many directions has naturally inflated the cost of public hunting areas. It will be virtually impossible in the future for the Commission of Game and Inland Fisheries to purchase enough land to provide the growing number of sportsmen with more space in which to hunt, although some limited acreages probably can be purchased as it becomes available adjacent to the present Commission-owned game management areas.

The present, as well as the future, of game management in the Basin rests to a large extent on privately owned land where about 90 percent of our wildlife resides. Efforts have been intensified to negotiate mutually beneficial cooperative agreements with large land-owning organizations in order to produce additional wildlife for public recreation.

Programs to assist farmers and hunt clubs with free wildlife planting materials and farm planning have been expanded. During 1969 approximately 14,000 landowners, a large percentage of whom reside in the James River Basin, received assistance in planting programs. Incidentally, most of these planting materials are now being produced on Game Commission-owned farmland. New techniques in farm game management are constantly being tested.

Current research activities are directed toward game

(Continued on page 21)

Deer are plentiful in woodlands drained by the mighty James, from its mouth to its headquarters.

GAVEL CHANGES HANDS AS COLEMAN BECOMES COMMISSION CHAIRMAN

CUSTIS L. COLEMAN

Custis L. Coleman, Richmond physician, was elected by the Commission of Game and Inland Fisheries on June 26 to serve as its new chairman. The ten Commission members are appointed by the Governor for staggered six year terms, and elect their own chairman from among their membership. Doctor Coleman was appointed to the Commission in 1965 by former Governor Albertis S. Harrison, Jr., and has served as vice-chairman for the past year.

RICHARD F. BEIRNE, III

Richard F. Beirne III, of Covington, editor and publisher of the afternoon daily *Covington Virginian* newspaper, was elected to the Commission's vice-chairmanship on the same slate that advanced his predecessor to chairman. It is customary to elect new officers at the Commission meeting nearest July 1 of each year. Mr. Beirne has been a member of the Commission for five years.

Photo by Burr's Studio, Covington

RALPH G. GUNTER

Former chairman Ralph G. Gunter, of Abingdon, turned the Commission's gavel over to its new chairman but will continue to serve as Commission member from the Ninth Congressional District. He was first appointed to the Commission in 1962, and was reappointed to a second term by former Governor Mills E. Godwin, Jr., in 1968. He served as vice-chairman for a year before assuming the chairmanship in 1969.

Commission photo by Kesteloo

VIRGINIA WILDLIFE

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CONSERVATIONGRAM

Commission Activities and Late Wildlife News . . . At A Glance

WHITE BASS STOCKED IN SMITH MOUNTAIN. The Commission of Game and Inland Fisheries released some 600 white bass up to 3 pounds in weight into the waters of Smith Mountain Lake during May. Commission fisheries biologists made the move somewhat reluctantly after discovering by net samples that local fishermen had already introduced the species. "We have long recognized the potential of Smith Mountain-Leesville Lakes as white bass lakes but were in no hurry to introduce this species into direct competition with the rather unique stiped bass population now in the Roanoke River," Hoffman said. "When we discovered that they were already there, we thought it best to introduce them in proper numbers to assure a good spawn rather than to wait several years for populations of the stragglers to build up," he added. North Carolina has stocked the species in Gaston Lake for the past two years.

"The white bass will very soon work their way down into Leesville and then into Buggs Island Lake," Hoffman said, "where they will compete to some extent with their larger cousins, the striped bass." It will probably take about four years for populations in Smith Mountain and Leesville Lakes to come up to levels where they will be important to fishermen. The abundant food in Smith Mountain-Leesville should produce rapid growth and this strain from South Holston Lake seems to be larger than those in some other southern lakes. The white bass is well established in the Santee-Cooper River system in South Carolina, which also has landlocked striped bass. Striped bass stocked in Smith Mountain and Leesville Reservoirs have proved disappointing.

NORTHERN PIKE AND MUSKIES STOCKED. Some 6,500 northern pike and muskies have been stocked in Virginia waters this summer. A total of 218 muskies about 8 inches long were stocked in the James River between Cartersville and Maidens. An additional 3,500 young muskies from the King and Queen Hatchery were allocated to the upper James plus other rivers and lakes including several Game Commission lakes. During the first half of 1970, 34 muskellunge over 6 pounds have been submitted for freshwater citations from around the state, testimony to the success of previous stockings in these waters.

HUNTERS TAKE 13.4% MORE DOVES WITH LIBERAL BAG. Hunters took only 13.4% more mourning doves during the 1969-70 hunting season when the bag limit was increased 50% from 12 to 18 per day, according to the analysis of hunter reports and wings by the U. S. Fish and Wildlife Service, Migratory Bird Populations Station. It meant an increase of about 2 doves per hunter for the entire season in the eastern management unit, and about 1.5 extra doves for each Virginia hunter. The number of hunters getting the limit of 18 dropped to 19% from the 35% credited with the limit of 12 the previous year. Only 6.6% of Virginia hunters managed to bag their limit of 18.

The increased bag limit which is expected to continue at least through the 1970-71 season is part of an experimental package designed to learn more about the mourning dove and how best to manage it. By manipulating the daily bag limit, statisticians can determine what effect dove hunting has upon dove populations, and can better pinpoint how many can be killed without reducing the overall population. The increased bag is tied in with a comprehensive program of banding, mail and phone hunter surveys, and the study of some 31,000 dove wings collected from hunters during the past hunting season.

The statistical study, now entering its fourth year, has already provided some new insights into dove number, behavior and biology. The data to date suggests that immature doves don't flock or become important to the hunter until they are about 3 months of age. Analysis of band returns and hunter kill indicates that there are about 200,000,000 doves in the eastern management unit of which hunters bag about 20,000,000 each fall. Virginia hunters are credited with downing about a million birds during the traditional split season. There is no evidence as yet that hunting is significant in limiting mourning dove populations.

Rabbits in Legend

PERHAPS no animal has so captured the imagination of grown-ups or the affection of children as has the rabbit.

Aesop, who lived about 620-560 B.C., told fables in the courts of kings. In *The Hare and the Tortoise* he has pictured the hare as the gay, cocksure little fellow he really is, whose long leaps outstripped the tortoise but who, in complete confidence in himself, went to sleep while the tortoise passed him. The moral of this fable is that the race is not always to the brashy swift but sometimes to the slow and bungling.

St. Francis of Assisi, who lived in the early part of the thirteenth century, is considered the most Christ-like figure of the Middle Ages. He regarded animals as his brothers. Because of his love for them, many charming legends are told. Among these is that the wild rabbits ran to him for protection.

The American Negro slave, adopting the rabbit as a hero in their tales, represented him as frightened and helpless. But they gave him qualities to overcome his weaknesses. He was pictured as a joker, a trickster, a braggart, and a ladies' man. They gave him a nimble wit and a bag of tricks which enabled him to get the better of stronger animals.

Vicariously delighting in the rabbit's exploits they saw in his successes, hope of overcoming great odds for themselves.

Based on such folklore, Joel Chandler Harris wrote enchanting stories told by Uncle Remus of animals in which B'rer Rabbit is the hero. In several of these, he outfoxes the fox and outdoes the wicked wolf.

The story in which B'rer Rabbit pleads with the fox and the wolf for his life and in which he convinces them that he would prefer any fate to that of being thrown into the briar patch, would do justice to the persuasive powers of any lawyer or politician who convinces his adversaries to do exactly what he wishes by advising them to do the contrary.

Safe in the briarpatch B'rer Rabbit hops gaily away—giving us a salve for any environment and a feeling that our own is best for us by chanting, "Born and bred in the briarpatch." There he certainly knows his way around!

Ernest Thompson Seton, naturalist, illustrator, and author, wrote of a beguiling baby rabbit, Raggylug, whose mother told him to be good and *lie-low* in the nest while she went for food. Raggylug was good for the *longest* time, then left the nest and hopped into the tall grass in the meadow. There he met a snake which immediately grabbed Raggylug's ear and coiled about him. The snake had every intention of lunching on the small rabbit.

Hearing his desperate frightened cries, Raggylug's mother appeared. She was no longer a timid rabbit but was made strong by mother love. She hopped over the snake, raking his body with her sharp hind claws until he was forced to free Raggylug, whom she then led across the meadow to a new home where he was presumably good and safe forever after.

Familiar with the story from my many tellings, my two-year-old son gave the name Raggylug to his own well-loved, much-dragged-about stuffed bunny.

In *Alice's Adventures in Wonderland*, Lewis Carroll delights the heart of childhood with the highly improbable adventures of Alice who followed a white rabbit down a rabbit-hole and met up with, among many unusual characters, the zany March Hare which told her emphatically that certain remarks of hers had no relevance to the matter in hand—"I like what I get" was not the same thing as

"I get what I like . . ."—and, while he was sousing the Hatter's watch in a cup of tea, insisted to the Hatter that butter should have suited the works in his watch perfectly since it was the very *best* butter.

With their fluid grace and winsome ways, rabbits were a natural for animated cartoons.

When Walt Disney produced *Bambi*, adapted from Felix Salten's book of the same name, Thumper, a lovable rabbit character, was created. Thumper was the first to see the fawn Bambi, and to announce his birth to the other animals. Later, he made the little fawn acquainted with the flowers, the birds, and the butterflies. Those who saw the movie will remember with laughter how Thumper, with great gusto, initiated Bambi into the intricacies of ice skating. And how he told Owl he never intended to become twitterpated—fall in love—but did!

The Warner Brothers' cartoon department, under the

ıand in Life

By LULA P. GIVENS
Christiansburg

Photos by L. L. Rue, III

leadership of Fritz Freling, a Disney graduate, got from the rabbit the inspiration and foundation for that most versatile animated character, Bugs Bunny.

The inimitable voice of Mel Blanc enabled Bugs to deliver a punch line with the same insouciance with which he had lost a race or triumped over his enemies in earlier folk tales. With a body built for speed Bugs' chases were the high points of many films. He was equally at home in the city as a con man or in Elmer Fudd's carrot patch.

He so appealed to young children that many a mother, because of Bugs' fondness for carrots and green vegetables, was able to get some down the throat of a recalcitrant child.

Rabbits and hares belong to the same family *Leporidae*, and have many of the same physical characteristics.

Durer, a famous German artist and engraver, painted the "Young Hare" in a realistic watercolor in the early part of the sixteenth century. He has drawn it true to life with long ears and whiskers, and soft brown fur. The hare is squatted and still, but so great was the skill of Durer that it seems breathing and alive. Durer had a great empathy for animals, and painted them in whichever country he traveled. He put them into many of his paintings with a sacred theme. He is said to have regarded all animals as evidence of God's presence among men.

More modern artists depict the male rabbit as an impeccable Beau Brummel with gal neckerchief, fancy vest, frock coat, top hat, and cane—quite the regular man about town, living it up so as to justify his carefree reputation.

And, appropriately, they picture a be-aproned Molly Cottontail with a market basket in her role as provident homemaker, or they see her with a medicine bottle and spoon as she plays the tender mother soothing a baby's small tummy.

Since early colonial times, countless children have been lulled to sleep with the folk song:

> "Bye, baby bunting,
> Daddy's gone a-hunting,
> Gone to get a rabbit's skin
> To wrap the baby bunting in."

The Germans are credited with having brought the rabbit into our Easter celebration.

According to legend, there was in that country a drought which lasted from one spring through another. There was no famine but food was scrace. The grown-ups became inured to hardships, but they regretted the lack of sweets, and delicacies, and little joys to enhance the heart of childhood.

Just before Easter, one mother had an idea which she told to others.

After the church service on Easter Sunday, parents suggested to the children that everyone take a walk in the woods behind the church before going home.

There, among the moss and leaves, the children saw brightly colored eggs. While they looked in amazement, a rabbit jumped from behind a big tree where he had been hidden from sight by bushes.

"The rabbit must have laid the pretty eggs," said one little girl. The mothers agreed that this must be true.

"Hurrah for the Easter rabbit! Hurrah for *Herr Oster Hase!*" all the children cried.

Since then the rabbit has brought colored eggs to little children in many far-away lands.

We observe the tradition in our country when we give baskets of colored and candy eggs to the very young. With us Herr Oster Hase has become the Easter bunny, and the rabbit is as much a part of our Easter as the lily and the egg.

Strictly a vegetarian, the rabbit belongs to the herbivorous group of the mammal family. Feeding on plants, it converts them into flesh and so becomes a main food for carnivorous animals. True, it sometimes leaves the plants of field and forest to feed on gardens and grains of farms and ranches which provide food for man and domesticated animals.

Rabbits multiply very rapidly and if they are not controlled by their natural environment, the weasel, fox, wolf, coyote, cougar, owl, eagle and hawk, they would soon be a menace. Rabbits are an excellent buffer food. It is when they disappear or can no longer be found that their predators are most likely to attack domestic animals in the fields and prey on poultry in the barnyard.

Ecologists say the rabbit is an important animal in the ecology of a natural community.

(Please see p. 16)

Rabbits in Legend & Life (Continued from page 15)

Animals and plants are usually in a rough balance in nature. When for any reason one kind becomes unduly scarce or unduly abundant in its environment, the balance of nature is upset and far-reaching trouble may be the result.

In 1850 a settler in Australia brought from England a few pairs of rabbits to make his new farm seem homelike and to provide himself with the pleasures of hunting which he had enjoyed in England. Rabbits are not native to Australia. Having no natural enemies there and with their tremendous fecundity, the rabbits spread like a plague.

The grass and crops of every cattle and sheep station were ravaged. It has been estimated that their depredations accounted for a loss of millions of dollars yearly.

Thousands of miles of wire fences were built and rabbit drives, in which entire communities took part, were organized in an effort to control them.

Millions of frozen rabbits and skins are exported each year as a result of these drives, but still the rabbit remains a nuisance there.

The cottontail rabbit is a native of America and is found in no other part of the world. It has the scientific name of *Sylvilagus floridanus*. It belongs to the order Lagomorpha and belongs to the family Leporidae.

It is about the size of a large house cat and has a length of from 17 to 23 inches. Even when food from grainfields is near and plentiful, it seldom weighs more than three pounds.

In its wild state it has grayish brown fur which is very soft and thick but of little commercial value. It has derived its name from its fluffy white tail.

Its long, pink-lined, donkey-like ears can be held erect or cocked when it is alert to danger. They lie flat when the cottontail is leaping away in fear from an enemy.

Conservationists and hunters estimate that a rabbit's strong hind legs and back muscles can send it eight feet in a single bound, but it is unable to keep up this strenuous effort for more than half a mile. It doesn't always choose to run as fast as this, but sometimes it lopes along in an unhurried way then disappears into a hiding place with which it is already familiar.

A rabbit's large, bulging eyes are placed on each side of its head. This position enables it to see in all directions.

Added to its keen sense of sight and sound, is the highly acute sense of smell provided by its sensitive wobbly nose.

Rabbits are gnawing mammals, but, unlike rodents, they have four front teeth or incisors; a smaller pair is found behind the front pair. These front teeth grow continually and are only held in check by constant use as the rabbit wears them down in gnawing. It is with these incisors that rabbits girdle young fruit trees in cold winters when herbage is scarce, and cause them to die.

The doe rabbit will attack an amorous male with her incisors after having mated.

Many children have a special feeling for the young of wild animals and early identify with them. Rabbits came into my life when I was very young, and I still have a deep empathy for them.

One spring afternoon long ago while I was playing in the yard, my sisters called me to the cemetery where they were planting flowers around my father's grave.

Not since the windy March day three weeks earlier when I had seen his coffin lowered into the ground and the earth heaped high above it, had I been able to enter the cemetery. I shook my head but at their insistence I went.

In the corner beside the gate, my older sister pulled aside the leaves and dry grass and showed me a nest of baby rabbits. Gathering one, she calmed it with soft voice and gentle hands before giving it to me. The tiny furred bunny, soft as the dandelion bloom beside the nest, reminded me of the kittens in the hayloft except the kittens mewed and moved, and this little one sat very quiet and still.

Just as my rag doll, Daisy, when hugged tight in my arms, could push back the shadows and take fear from the darkness at bedtime, so could the little rabbit ease the pain of loneliness. Holding it close, I could bear to look at my father's grave.

After that, I made frequent small trips to the graveyard to look at the bunnies. My sisters had told me I must not pick one up again. But even my looking must have made the mother rabbit anxious. Watchful and uneasy, she must have been near by and have seen me beside the nest for soon she moved them.

This hurt, but my sisters told me they were all right in a new nest. Or perhaps on their own they scampered through the fields seeing though unseen by me.

I missed my father. He had been the oldest member of our family; I, the youngest. He had been too old to work;

A nest of baby rabbits.

I, too young. So we had been constant companions, content to be together and take little walks on our own.

That summer, feeling lost and alone, I skipped up and down the lane on small errands for my mother. On one such trip, beside the lane where it met the clover field, I saw a rabbit sitting still as still. That it might not be my rabbit of the cemetery never once occurred to me.

All the vivid imagination and implicit faith of childhood were mine. I had only to see the pasture field covered with daisies to believe that the fields of heaven were filled with asphodels, as my mother had read.

My sisters had said my rabbit was safe in the fields unseen by me—and here it was.

Since these things were true, then why could not my father be with me? Unseen.

I slowed to a sedate walk and, matching my steps in perfect rhythm to my father's imagined ones, I walked beside him up the lane as I had often done.

This memory is a precious and impressive one of my childhood. It gave me, a six-year-old child, a faint inkling of what the words life, death, and heaven might really mean.

Wildlife biologists say that at the age of six months, a female rabbit may begin breeding and produce five or six litters every year, containing from four to eight young. Mating occurs in early spring after a courtship in which fancy running, hopping, and leaping contests are tried out.

Rabbits are definitely not monogamous. After mating, the female has no further use for the male and chases him away. He has to find female companionship elsewhere, which probably accounts for his reputation in folklore as a ladies' man.

The female prepares for her young by digging a hole in the ground. She may try out several sites before she is pleased. She makes this excavation about six inches deep and six inches wide. It is less than a foot in length.

She lines this with dry leaves and grasses. She then pads it with fur pulled from her breast, and roofs it over with a covering of grasses, weeds, and leaves as a shelter from the elements and as a cover from the prying eyes of marauders.

After the gestation period of 28 days, the doe gives birth to four or five baby rabbits. They may be born a little distance from the nest. They are about the size of a man's thumb, and weigh no more than an ounce. They are blind, pink, and naked save for a fine fuzz which can hardly be seen. But they already have the white blaze, a birthmark on their foreheads.

A cottontail relaxes.

The mother cleans them with her tongue and allows them to nurse before carrying them by the scruff of the neck to the fur-lined nest in the manner of a mother cat moving her kittens, one by one.

Some biologists say she feeds them only when it is dark so as to keep safe her precious secret from those which prowl for prey.

She herself spends the day nearby the young, ready to come to their defense if needed. When a predator approaches the nest, she may leap within his vision so that he will follow after her. If this ruse fails, she has been known to place herself between her family and the foe, even one as deadly as the weasel.

This, in spite of the fact that the words "as scared as a rabbit" are almost as symbolic of cowardice as the phrase "chicken-out."

In a week the nestlings' eyes are opened, they are furring out, and in two weeks they may be strong enough to leave the nest and forage on their own.

Seton, a world famous naturalist, who organized the Woodcraft-Indians which later became the Boy Scouts of America, went into the fields and got his information by actual observation. He said that the young rabbits, when able to leave the nest, stay close to the mother and taste the clover, alfalfa, teaberry, or other plant on which she nibbles so they will be able to get the same when foraging for themselves.

Seton said the mother teaches them to communicate by thumping on the ground. A single thump meant *lay-low* or *freeze*. Two thumps meant *come*; three meant *run-for-life*.

From her they learned that the safest refuge and the final one was the brier patch.

Of necessity, the mother's training of her young is short. She will have a new litter in weeks. So strong is her urge for procreation, that a female rabbit has been known to mate on the same day of having given birth.

Born into a hostile territory, a rabbit is assaulted from land and sky. His daily life is a series of escapes which finally end in a violent death either from a natural predator, or man's gun or snare.

Wild rabbits have an average life span of about a year. They are able to survive this long because nature has provided for their defense by giving them alert senses, quick wit, and nimble leg work.

Rabbits may live out their entire life on an acre of land. They are famous for knowing every bit of it.

They may have several homes or places of refuge from an enemy—none of which they occupy permanently—a hole under a tree root, a hollow log, a burrow underground with several openings, a brush pile, and best and safest of all, the blackberry patch.

I have seen my brothers chase a rabbit into a brushpile and, while they and several dogs concentrated on the hole into which it had gone, the rabbit would explode like a small bomb from another opening and be well on its way to safety before boys and dogs had recovered from surprise.

Strange neighborhoods are confusing, and if turned loose in one, the rabbit loses its cool and runs in headlong flight, taking no cover even though it may be there.

So adept is the rabbit in outwitting its enemies that a rabbit's foot is highly regarded as a good luck charm. In magical powers, it is second only to that of a four-leaf clover.

With a rabbit's foot secure in purse or held tightly in one's hand, many a person has cheered on to victory a favorite team. Or when bad luck comes, one may explain it thus—"I lost my rabbit's foot."

Many authorities claim that the cottontails are the number one game animal of North America, not as spectacular as some, certainly. But because they survive in numbers, they are available to all, they demand no long-range planning or expensive equipment, and above all they are challenging and fun for man and dog.

All they need to make themselves at home and plentiful for the hunt is a pleasing game habitat, which is the intricate relationship of soil, water, and plants, commonly called "cover."

The best land of a farm need never be used because all the adequate things necessary for their well-being can be incorporated into the waste places of a farm or other land.

Rabbits represent the miracle of wildlife as they play in the moonlight, cuddle their young, escape from danger. They are the nestling in the grass, the scamp in the cabbage patch, the vagrant lover. They are the country child's earliest adventure, the hunter's challenge, the camper's first meal.

Rabbits are immortality, symbolic of the continuity of all wildlife as it renews itself in forest, field, and stream.

HUNTING THE WILD BEE

By AL SHIMMEL
West Decatur, Pennsylvania

I HOLD the small wooden box close to my ear. The angry buzzing of the captive subsides into silence. I am certain, from past experience, that the bee has its head buried deep within one of the cells and is taking on a cargo of the diluted honey with which I have baited the empty comb. I push the point of the three foot stake firmly into the ground, place the box on the small platform at its top and slide the cover back. I crouch quickly so that the box will be silhouetted against the sky.

The seconds tick by. The bee appears on the rim, pauses for an instant, then becomes air-borne. The first circle of its spiral climb is slow and barely a yard across as it marks well the location. As it rises higher, both its speed and the size of the circle increase. My straining eyes are dazzled by the sun as I strive to mark its course. Suddenly it darts away. The flight is on a line—a bee-line toward the distant

woods. I lose sight of it in the distance but not before I have established its direction using distant landmarks for future reference. I check the direction with a pocket compass, then settle back to wait for its return.

Honey bees were not native of North America but were brought here by the early settlers. Swarms often escaped the vigilance of the bee keeper and, finding crevices in hollow trees more to their liking than the woven straw skeps, reverted to the wild.

The art of finding these wild bees, a pursuit that probably had its origin in the primitive cultures of the Old World, was revived and refined until it became a part of pioneer life. The scarcity of sweets led these early hunters to brave the wrath of the small dark colored wild bee that sported a temper that was even shorter than its body. The bees defended their hoard of treasure with their lives.

Unlike wasps and hornets the sting of the honey bee is barbed. Once it penetrates it cannot be withdrawn. The poison sac is closely connected and even though the insect is brushed away, the sting remains. The normal reaction is to use the thumb and forefinger to pull the sting away. In so doing the attached poison sac is compressed and the entire contents are injected into the flesh. The sting is removed by scraping it off with the fingernail or a dull knife blade.

There are those who react violently to the effects of the venom. Huge blotches cover the skin. Hoarseness and shortness of breath are symptoms. Occasionally death results. Other individuals are wholly or partially immune to the effects of the sting. In some the only mark is a tiny welt with a red dot to mark the entrance of the sting. In others there is considerable pain accompanied by moderate swelling that may linger a day or two and be marked by considerable itching as it subsides. Immediate first aid treatment consists of an application of damp baking soda or even honey to neutralize the venom. Persons who are allergic should carry a bee-sting kit as prescribed by a physician. . . .

The bee has returned. I glance at my watch. Less than ten minutes have elapsed since it left. A bee will fly a mile in approximately five minutes. Allowing for time within the hive to discharge its burden, I estimate that the hive is within a half mile of my stand.

Again the bee buries its head in one of the cells. I dust its back lightly with a camel hair brush dipped in flour. This will mark this individual bee from others that will follow. Again I closely watch its flight as it leaves.

Within a half hour there is an almost continuous flow of bees hurrying from the woods to the bait and back again. I wait until a half dozen insects are busy inside the box, then close the cover, pull up the stake and move along the line of flight. When I have reached the edge of the timber, I once more push the stake into the ground, set the box on its platform and release the captives. Within a few seconds they have regained their composure and are gone.

While waiting for their return I refill the depleted cells with honey water. A medicine dropper allows this task to be accomplished quickly and efficiently. Diluted honey is used instead of honey as it comes from the combs for a particular reason. Bees that take on a cargo of pure honey find it such a heavy burden that their flight is erratic. A mixture of three parts water to one part honey approximates the weight of nectar.

It does not require much time until the line is once more established. The problem of following their course is complicated by the timber. I mark another bee and find that the time for making the round trip is considerably shortened. The tree is close at hand.

I leave them to their work and make a search of the timber. Every dead tree, every knot hole, every dead branch that might indicate a cavity large enough to house a swarm is scrutinized but all in vain. Occasionally I see a bee streak overhead, but I cannot find their tree.

Rather than resort to the time consuming search of every

tree in the area a strategy has been developed to narrow the bee hunter's quest. A second comb is filled with bait. A half dozen bees are trapped within the box and the cover closed. The second comb replaces the box and continues to attract bees. The captives are carried a hundred yards more or less at right angles to the original line. In a short time the bees have established a second line. Its direction is checked with the compass and drawn on a piece of graph paper. The original line is also charted and the point of intersection of the two lines estimated. Generally these estimates will pinpoint the location within a few square yards.

With the compass as a guide I follow the bee line through the woods until I am close to the estimated vertex of the two lines. I hang a conspicuous ribbon streamer from a branch and return to the first station and repeat the lining. I find that the calculated intersection falls short of the true point. I walk slowly ahead and when I am close to the goal I pause. I step into the old timber road that cuts across the woods. My ear picks up the drone of flying bees. The odor of the hive lies heavy on the air. The sunlight flashes on a flying bee. I mark its course. . . . There is the TREE!

Each bee tree has an individuality. This one is a living white oak with a diameter of about eighteen inches. The opening is about four feet from the ground. It extends upward along an old frost crack. Dark stainings mark the entrance. It has been partially blocked by the efforts of the living tree to heal the wound and partly by propolis, the dark colored, waterproof, bee glue used to seal and close the crevices in their dwellings.

I move closer. There is a constant stream of insects entering and leaving. I notice that these are large, light colored bees indicating that it probably is a swarm that has escaped from some apiary. These larger insects have a gentler and more even temperament than the smaller, dark bee. I have no fear of moving closer. There is a pleasant droning of their wings, quite different from the high pitched whine that I learned from experience, over many years, indicates an angry bee on the prod.

Bees alight on the rough gray bark beside the entrance and quickly run inside. The hollow extends upward from the opening. I see the tips of comb that indicates the swarm is active and healthy. The incoming bees seem to have the right of way. The pollen baskets on their hind legs, crammed to the brim, form a pleasing contrast to the more subdued colorings of the bee. This is not pure pollen but a mixture of pollen grains glued together with honey. This mixture is a balanced food. Pollen is high in protein while the honey is a mixture of carbohydrates, minerals and vitamins. It is stored in cells where bee keepers give it the name "bee bread." Workers that attend the queen as she lays eggs, feed her a predigested mixture of pollen and honey which is called "royal jelly."

By building a special cell and feeding the grub on "royal jelly" the bee emerges as a queen. An unfertilized egg becomes drone. Routine feeding produces the worker bee. The sex and function of the individual insect is regulated for the common needs of the colony. Without the pollen gathering activities which benefit plants by cross pollination, many of the food and decorative plants that are beneficial to man would cease to exist.

The communal life of the hive revolves around the queen. After she has been impregnated she becomes an egg laying machine. Her life expectancy may extend to five years. She is cleaned, fed, and tended by workers. At the peak of the honey flow she may lay as many as 2500 eggs daily. The queen's sting is not barbed and can be used repeatedly. She reserves this power for use against a rival.

The drone is stingless. His only function is to mate with the queen. Once this is accomplished he dies. Other drones are fed by workers during the summer but in late fall are driven from the hive to die, of starvation.

The workers are the most interesting members of this insect society. It requires 23 full days for development. The egg hatches in three days. For three days the larva is fed royal jelly, then it is fed bee bread for three days. At the end of this period it has grown to a size that fills the cell. The cell is then capped with porous wax that allows for the passage of air. The larva undergoes a metamorphosis from larva to pupa to adult. This period of development requires 12 days. When the bee emerges as a young adult its first

duties are those of cleaning. It cleans the cells in preparation for receiving eggs. It acts as a scavenger in removing waste and dead from the hive and, in general, doing the work of a "cleaning woman."

After ten days the food manufacturing glands in the head develop and are capable of changing the stored pollen into royal jelly. The bees now become "nurse maids." Honey and pollen are fed to the older larvae and honey alone to other adults. This period lasts about ten days. During this time the bees make short flights away from the hive to become familiar with the area.

At the end of this period the feeding glands contract and the wax glands mature. They no longer feed the colony but are graduated to the work of construction and guarding.

(Continued on page 20)

Song of the Cicada (Continued from page 9)

truding twig. Presently, its skin begins to open down the back, and, within an hour or so, the adult cicada has crawled out, unfolded its wings and, instinctively, gotten its bearings. By dawn, it has flown into the branches above.

As you might expect, if you've been listening, these warm afternoons, singing is the chief topside activity of the cicada. Singing? Well, not really. The "song" of the cicada is actually a sort of drumming that the male cicada produces by vibrating paired membranes at the base of his abdomen. He drums, or sings, to call together the members of his species, all of whom have highly developed hearing organs, nearly as sensitive as the human ear. He sings to summon a mate, who, responding to his vibrations, alights at his side. At the approach of his dreaded enemy, the cicada-killer wasp, he sounds the piercing squawk of disturbance!

Black and yellow, one of the very largest wasps, the cicada-killer is a digger and a hunter. Every spring, about the time that cicadas are preparing to pop out of their underground retreats, adult cicada-killers also emerge from subterranean nests and mate. From the cicada's point of view, the timing couldn't be worse.

The fertilized female cicada-killer digs a long burrow in

Empty cicada nymph shell, split down the back where the adult emerged.

the ground, at the end of which she fashions a cell. Then, she wings away in search of a cicada, the main-course-to-be for the wasp larva that will occupy that lone chamber.

When she captures a cicada, the cicada-killer immobilizes it with a paralyzing sting, slings it beneath her body, and flies off in a descending track toward her burrow. Should she fail to gain the entrance to her nest on the first flight, the weight of the cicada being too great, she struggles up a tree or pole and, again, takes to the air.

Upon reaching the tunnel, she deposits her prey, food enough to bring one wasp larva to maturity, in the prepared cell. She then lays one egg in the cell, seals the entrance and begins another. In this way she spends her summer, digging and hunting, assuring that another generation of her kind will venture forth in another spring to hunt the cicada.

And so it should be, for high in the heavy boughs above, the cicada is singing his sad, sustained song into evenings that grow ever shorter. Now he has mated and soon he must die. But tucked away in the woody tissues around him are millions of tiny eggs . . . assurance, indeed, that his song will go on and on.

Hunting the Wild Bee (Continued from page 19)

Wax is produced by glands on the underside of the body. It emerges as thin plates, hardens in the air and is scraped off by the bee to be used in cell construction. The cells are six sided with a uniform thickness along the sides of about 1/350 of an inch.

After the wax glands cease to produce, the bee becomes a true worker and makes a specialty of foraging and gathering. During the period of intensive honey flow a bee may wear itself out and die within a month. At other times the bee may live for six months or longer.

Wild bees make themselves at home in a wide variety of situations. I found one swarm in the boxing under the eaves of a school building. Another was at home in a deep crevice in a limestone cliff. One swarm had filled the trunk of a junked car with comb and honey. They gained entrance through the hole where the lock had been removed.

One autumn I tracked a swarm into a crabapple thicket. The bees had nearly a bushel of comb and honey built in the open air. I was delayed several days. When I returned the honey and bees had been eaten and the combs destroyed. A family of raccoons quickly took advantage of the torpidity of the insects.

A swarm gained entrance to a hunting cabin through a knothole in the siding and built a comb in the space between the studding. Unfortunately for both bees and the owner, a bear discovered the hoard. It ripped away the siding and then broke through the inner wall, which was of plasterboard. After looting and vandalizing the bear left through a window, breaking both glass and sash.

When a tree is found, what then? To some, the successful practice of the woodcraft skills is ample reward. To the naturalist, the swarm is a part of the ecology and should be studied but not disturbed.

Many consider the tree as the pot of gold at the end of the rainbow. The honey is, as it was to the ancients, "ambrosia of the Gods." The sharing of the hard-working insect's hoard carries a responsibility. Permission must be obtained from the owner of the land to cut the tree. Ample provision must be made to house the swarm and provide it enough food to carry it through the winter or until it can once more establish its independence.

The tree is generally cut in the autumn when the honey harvest reaches its peak. If at all possible, enlist the services of an expert. After the tree is felled, the extent of the hollow is determined. A saw cut is made, half way through the trunk at either end. A section of the trunk is split away to reveal the bees and combs. Gloves, veil and sting proof clothes are worn. A commercial smoker, such as beekeepers use, will bring the insects under control. A hive is set up and brood comb containing the pupa are transferred to it. When once the queen is found and placed inside the hive the swarm can be moved into new quarters by the aid of smoke and a soft brush. Share the honey in the tree with the bees.

The connoisseur can distinguish by taste and bouquet the flower from which the honey came. Wild honey is a special delicacy.

Beeswax is a by-product of the hive. It has a variety of uses. In plant propagating it is an ingredient in grafting wax. The archer uses it to wax and waterproof his string. Threads are stiffened and waterproofed. These uses are a few of the many. The candles, burning on the altar as we worship, are the wax that the bee made from the distilled sweetness of the blossoms. Thanks to the bee!

Wildlife in the James River Basin (Continued from page 11)

population trends. Other studies are being carried out to determine the best seasons and bag limits for game populations. The over-all objective of most Game Commission activities is to provide the most recreational opportunities to the most number of people without detrimental effect on the game species involved. An outstanding example of this philosophy was the introduction and gradual expansion of the spring gobbler season. This popular sport, open during an unusual time of the year for hunting, has provided thousands of days of recreation to Virginia hunters without adverse effect on the wild turkey populations.

Many of the problems and programs described above are not unique to the James River watershed region. Unfortunately, many of the problems affecting wildlife populations everywhere involve human population increases and resulting competition for every acre of land. Since land priorities will usually favor resources or uses other than wildlife production or hunting recreation, lands still available to the game manager must be made to produce more wildlife in the future, and those in the James River Basin will undoubtedly continue to be among the most productive wildlife regions in Virginia.

Chart I
BIG GAME HARVEST—JAMES RIVER BASIN
1968-69

County or City	*Deer*	*Bear*	*Turkey* *Fall Season*	*Turkey* *Gobbler Season*
Albemarle	417	14	24	47
Alleghany	801	7	280	34
Amelia	511		24	32
Amherst	185	6	26	21
Appomattox	264		15	14
Augusta	1,215	51	468	56
Bath	1,962	10	651	44
Bedford	103	13	5	24
Botetourt	946	12	290	35
Buckingham	756		55	
Campbell	42		9	5
Charles City	367			
Chesterfield	405		21	24
Craig	871	4	196	35
Cumberland	481		26	40
Dinwiddie	429		18	48
Fluvanna	925		15	18
Goochland	261		20	
Greene	31	12		3
Henrico	110			3
Highland	897	14	408	30
Isle of Wight	322			
James City	234			
Louisa	270		23	
Nelson	123	7	9	36
New Kent	348			2
Nottoway	321		7	27
Orange	144		15	29
Powhatan	423		21	12
Prince Edward	143		9	
Prince George	392		6	9
Rockbridge	724	8	333	44
TOTALS	15,456	158	2,974	672
% OF STATE TOTAL	45%	57%	65%	47%

Worm Fishing (Continued from page 7)

The worm is allowed to sink, then is reeled in slowly a couple turns of the reel, after which it is rapidly retrieved and cast again. The theory here is that the bass hears and sees the worm when it first strikes the water and he will hit it fast if he wants it at all. If he doesn't desire it, then another cast rapidly is made to a different spot to give the worm exposure to a bass which might show interest.

Most worm fishermen, however, will try to entice the bass to strike with the action they give the worm during the retrieve. They cast out, allowing the offering to sink, then crawl the worm back to the boat by slowly raising their rod tip and reeling in the slack as the tip is lowered again. The process is repeated time and again until the worm reaches the boat.

Why are plastic worms so attractive to bass? I quickly rule out the belief that bass go for them because they look much like a real worm. Bass gobble up plastic worms, I believe, because they have a wonderful pulsating, shimmering wiggle to them which represents something alive, juicy and very edible. Realizing this should help you in your

Plastic worms, properly rigged and fished, put big bass on the stringer.

retrieve. It should rule out trying to fish a worm very fast like you would a plug which is designed to give off the vibrations and quick flashes of a minnow or food fish.

What color worm is best? Most anglers around the freshwater lakes of Virginia appear to pick purple first and black second. The light green color recently has come on as a strong third. It is wise to occasionally switch colors in order to let the bass decide what they like best.

How good are worms? Ask James A. Hamlett of Rocky Mount. Fishing off a point in Smith Mountain Reservoir one day, he had reeled in his worm and had it dangling about a foot above the water, preparing for another cast. Suddenly a muskie, nearly 40 inches long and 14 pounds heavy, came leaping out of the water, arched sharply, and grabbed the worm as it tumbled downward into the water. Even as good as worms are, though, it should be pointed out that most times fish aren't willing to go to such extremes in order to gobble up one.

Today's Youth (Continued from page 5)

Obviously the effluence of consumption is better controlled if the consumption is reduced. The pride of status in having many things, may, in time, become pride of status in being able to do without the trappings Madison Avenue has always tried to make us believe we need.

It is the youth who best controls the consumption of goods these days. It is young people who can band together and put the pinch on industry that pollutes and manufactures non-essential products. They should compile lists of such industries, labeling their products "no-nos." It is youth who still have the time to forestall the personal disease of gadget-grabbing, the quest for material goods that often become the pacifiers for adult disappointment and boredom.

"The very nature of the industrial society the young people are inheriting," writes former Interior Secretary Stewart Udall, "holds the seeds of their ultimate destruction. Technology and affluence have not bred the best of all possible worlds."

Third, psychological necessities encouraging the multiplicity of manufactured goods should be redirected to a more legitimate need—communing with nature. Millions of Americans leave the cities on weekends in quest of the comparative privacy of the outdoors. Private areas of beauty and semi-trammeled national and state-owned wildernesses should be considered sacred territories, holy-of-holies, sanctuaries to be enjoyed and appreciated, but because they are sanctuaries, respected and preserved.

Some developers, eager to make money (looked upon in outmoded days to be an end that justifies any means), condemn land use for species preservation. They claim conservationists and naturalists love birds and animals more than people. They are the individuals who harbor the invalid ideas that all "growth is good," and all "business is beautiful." Their attitude is "after us, the deluge." They are the ones who believe natural beauty and its heritage in our country are of lesser worth than the market value of the land as real estate. They pay lip service to "progress" and are willing to contribute nothing but sameness and mediocrity on which they would be satisfied to see generations feed. They pay little attention to how such complexes would affect the beauty of our environment, which, in their limited outlook, should belong solely to the owners of the land on which the environment exists and to be shared, at best, only at the price of admission.

Why are rare species important? Why should their habitats and places of beauty in general be preserved? One may never go out to see an egret, but there may be a deep-seated vicarious peace of mind for some people to know egrets and other birds exist and COULD be accessible. People may need to know this realm of life does exist just as much as actually going out and visiting it. Today's young people don't want to be among the first generation to be denied what Kenneth Boulding calls this "psychic capital."

Places of natural beauty must be protected as would the sanity of the populace be protected. In nature, one finds life as it really is, because life is as it should be. A bird, a butterfly, an alligator are real because they behave as they should and do what they should be doing without reservation, double-dealing or ulterior motive. That they act from simple instinct is not to say their lives are simple. Nature and its ways may be complex, but no more misleading than an observer would mislead himself.

Nature offers the mind of man myriads of detail he can

It was a day of indoctrination in the ramifications of pollution problems.

see for himself. No one is forcing a naturalist to believe what he sees or does not see. There are no "should and shouldn'ts." He is free to draw his own conclusions. What he concludes may not be right, but what he observes is not wrong. In nature one finds an absolute. It unravels as it should to those who can discern. If it doesn't, then it is the discernment that is awry, not the unraveling.

Because of its openness, nature attracts young people. Their memories of exploration of hills and woods as kids are not as dim, are less a forgotten joy than they are to older persons. The young see no double standard in the habits of a squirrel, no wasted motion in the takeoff of a blue heron, no confusion in the ants' building of a hill. Everything has a purpose, all akin to a simplicity of existence all young people wish they could have out of a world confused by human need and twisted motive.

The need for living room, the need for economy of wants and for the saving of psychological havens offered by wildernesses are all balled into a single nugget of concern—survival. Dr. Barry Commoner, in last April's issue of *Environment* magazine, summed it up succinctly:

"We are enormously fortunate that our young people have become particularly sensitive to the threat of environmental catastrophe. Nor is this surprising, for THEY are the first generation in human history to carry strontium-90 in their bones and DDT in their fat; their bodies will record, in time, the effects of the new environmental insults on human health. It is they who face the frightful task of seeking human knowledge in a world which has, with cunning perversity, transformed the power that knowledge generates into an instrument of catastrophe."

From coast to coast students peaceably demonstrated their awareness of the twin dangers of over population and environmental degradation.

Edited by HARRY GILLAM

Fine Gobblers Attest to Good Spring Season

The happy hunter in the top pictures is Lon Marks of Capron, Virginia, who managed to bag two big gobblers in Southampton County last spring. One weighed 23½ and the other 20½ pounds. Shown below with the Blue Ridge Mountains in the background is William Gudal, a senior law student at Washington and Lee University, with the 19½ pounder he downed at 35 yards after calling him up with a slate caller.

Save Virginia's Wetlands Committee Formed

The Virginia Wildlife Federation has formed one of the first statewide citizen committees to save the remainder of Virginia's wetlands. President Carl A. Wiberg of Falls Church, Virginia, reports that Dr. Marvin Wass of the Virginia Institute of Marine Science and Fairfax Settle of the Commission of Game and Inland Fisheries have agreed to serve as consultants to the Wetlands Conservation Action Committee as has Clive L. DuVal, II, State Assemblyman and Democratic candidate for the U. S. Senate. Mr. DuVal was instrumental in stopping the proposed drainage of Hunting Creek near Alexandria recently. His efforts in the last General Assembly were effective in getting the Scenic Rivers bill passed, winning him the Wildlife Federation's Conservation Legislator of the year award.

Mr. Cliff Golden of Virginia Beach, 1st Vice President of the Federation and chairman of the committee, asked for volunteers to serve on the committee and several present at the group's quarterly meeting responded enthusiastically. The major thrust will be through the press, direct mail and letters to the state assemblymen, reported Wiberg. "We must enact meaningful wetland legislation now if we are to stop the unbalancing of nature's ecology and prevent our coastal marshlands from being dried up by the commercial land grabber!" he said.

Citizens interested in adding their support should write to Virginia Wildlife Federation, Wetlands Conservation Action Committee, 800 Oriole Drive, Virginia Beach, Virginia 23451.

Richmond Natural History Society Elects

David K. Roszell was elected president of the Richmond Natural History Society for 1970-71 during the group's 15th annual meeting held at Fort Harrison.

Other officers elected were Llewellyn Powell, vice president; Miss Helena H. Dean, recording secretary; Mrs. Elihu S. Estes, corresponding secretary, and Miss Virginia P. Lacy, treasurer.

The Richmond Natural History Society, organized in 1955, is devoted to the study, enjoyment and conservation of birds and all natural resources.

Governor Holton Adds His Support to Ducks Unlimited

Commission photo by Kesteloo

Governor Linwood Holton holds a certificate of appreciation from Ducks Unlimited for his personal check to aid in the battle to maintain North American waterfowl populations. Standing next to the Governor is C. Arthur Rutter, Jr., State Chairman of Ducks Unlimited, and at the far right is Northern Virginia D. U. Chairman Frank Eubank. Since the 1930's Ducks Unlimited has acquired control of over 2 million acres of waterfowl nesting and will enlarge this area to over 6½ million acres during the 1970's.

Hunting Mishaps Hit All Time High

Hunting accidents ended at a 9 year high of 69 for the 1969-70 fiscal year. Although the record of 69 accidents is the worst since 1965-66 when 58 were reported, the total of 8 fatalities was slightly below the average of 9. No reasons for the sudden upsurge of mishaps was evident from statistics. Shenandoah County suffered the worst rash of accidents ending up with a total of 8, one of them fatal.

The majority of the victims were hunting small game when tragedy struck. Visibility was good in most cases and over half of the victims were wearing warning colors when injured. Twenty-two of the accidents, including two fatalities, involved self inflicted wounds. Shotguns were involved in 49 of the mishaps, including 4 of the fatalities.

Boat Access Book Available

A new edition of the Game Commission's popular "Boating Access to Virginia Waters" is just off the press. The 24 page booklet contains simple maps of most rivers and lakes in the state used by boaters with public access points indicated. The new edition includes all ramps completed through the first half of 1970, plus maps of Pound, Flannagan and Gaston Reservoirs not previously included. Other sections cover the Eastern Shore, Southeastern Virginia, Northern Tidewater, the James, the Shenandoah, Southwest Virginia and South Holston, Smith Mountain, Claytor, Buggs Island, Philpott and Leesville Reservoirs. Copies may be obtained free by writing to the Game Commission Publication Office, P. O. Box 11104, Richmond, Virginia 23230.

Virginia Trappers to Meet

The Virginia Trappers Association will meet at Grahams Marina on Smith Mountain Lake Sunday, September 13th. There will be beaver, otter and coon skinning and fleshing demonstrations. A "guess the weight of the beaver" contest will be open to both men and women with special prizes for each. The route will be marked from Burnt Chimney. "All are welcome," says secretary Gene Morgan of Abingdon.

Edited by ANN PILCHER

Isaac Walton League Honors Essay Winners

23rd Annual Wildlife Essay Contest cash award winners from Clarke and Frederick Counties and the city of Winchester were honored by IWL members at the Isaac Walton Park in Frederick County. Winners, who received certificates from the local League in appreciation of their efforts in the contest, and their parents were guests of the club for dinner. Front row, from left: Steve Melester, Kimberley Williams, Sheryl Burleson and Debbie O'Brien. Rear: Gregory Smith, Branson McKay, Paul Gustafson, and Russell Levi. Debbie and Paul were state-wide grand prize winners in their grades: 9th and 11th. Russell Levi, a third *prize* winner and a 10th grader, is also a third *time* winner in the annual competition.

244 Young Fishermen in I.W.L.A. Rodeo

At its Annual Children's Fishing Rodeo on May 17, 1970, at The Izaak Walton Park, east of Christiansburg, the Christiansburg-Montgomery County Chapter of The Izaak Walton League of America awarded trophies and prizes as follows:

Grand Prize Trophy for largest fish of the day went to Leroy Linkous, Jr., of Blacksburg for a 19" catfish.

In the 0-6 age group, trophy for largest fish was awarded to Ricky Howery, Troutville, for a 13¾" rainbow; 2nd place was won by Darrell Musselman of Christiansburg—13½".

A big contest in the 7-9 age group was narrowed down to two first-place winners. For matching 13½" trout, Don Cole, Shawsville, and Jeff Wallace, Christiansburg, were each awarded a trophy. A four-way tie for second place saw Barry Holbrook of Salem, Kerry East and twins Dale & Donald Whitlock, of Christiansburg, showing 13" rainbows. Each of the four earned a second place prize.

For the 10-12 group, first place winner was Larry Howery of Christiansburg for a 15" catfish; second prize went to Danny Graham of Salem.

In all groups, trophies were given to first place winners and a year's subscription to *Virginia Wildlife* to second place winners.

As in the past, all children registered were treated to free drinks and hot dogs. An estimated 275 fish were brought by the judges' stand, including some by children that had not been registered.

The most frustrating part of the day was being able to see 20 to 25 inch rainbow trout swimming about and not being able to catch one.

Thanks goes again to the Christiansburg Rescue Squad for being on hand and many, many thanks to those members of The Izaak Walton League who spent much time and hard work in preparing the park and pond for the children to enjoy. It was noted by some that after the first few minutes a great number of children were more interested in the park with its picnicking and playground areas and equipment than they were in fishing. Plans even now are being made to further improve on this very successful venture.

—B. K. KING
Christiansburg-Montgomery Co. Chapter I.W.L.A.

Success With a Savage

David Watts of Glasgow, Va., used a .243 lever action Savage, a gift from his grandfather, to down this 12 pointer on the last day of the '69-'70 season. *Virginia Wildlife* covers complement his trophy.

Scholarship Winners Announced by Virginia Forests, Inc.

Rising sophomore at Blacksburg's Virginia Tech, Donald E. Munsey, Jr., of Fredericksburg, has been selected to receive the Victor W. Stewart scholarship as provided by Virginia Forests, Inc. This will mean $500 per year for each of Munsey's last three undergraduate years.

Larry D. Maxey of Scottsville and Larry D. Moore of Roanoke, each planning to enroll as freshmen in the Division of Forestry and Wildlife at VPI, will receive $500 scholarships for their freshman years.

The scholarships are financed from revenue received from invested contributions to the Virginia Forests Educational Fund, established 12 years ago. Virginia Forests, Inc., chartered in 1943, is a statewide association of forest landowners, industries, businesses and others whose major purpose is to create a better understanding of the importance of the forest and related resources of Virginia, and to encourage the development of those resources through private initiative and free enterprise.

Scouts Learn Safety

Four adult scout advisers joined twenty-four boys of Unionville Scout Troop 97 in taking a five-hour hunter safety course. Instructors from Piedmont Sportsman Club (shown here) include Mack Tuck, Bob Reeves, Cliff Turner and Frank Houseman. Scout leader is Wayne Jones. Certificates of completion were presented at Court of Honor ceremonies on May 2.

Photo courtesy *The Orange Review*

SHARING THE WORLD

By CARSTEN AHRENS
Pittsburgh

My group of Rangers is going to spend this month largely in the study of plants and animals. This means they will learn the various kinds of organisms with which they share the earth, and why they are important to each other and to the Rangers. This is an experience in *Conservation.*

They'll learn about plants and animals as individuals and communities.

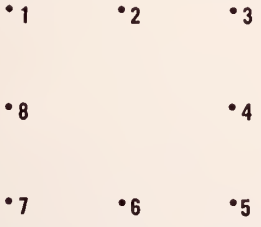
Since the project deals with living things, the interrelation to each other and to the environment in which each must develop, it will be an experience in *Ecology.* Since the Rangers will identify plants and animals by their names, it will be an experience in *Taxonomy.*

SETTING THE PROJECT

Most of the Rangers live in apartments, but Bob has a generous dad who owns a woodlot. He said "Yes." We'll divide the boys into groups of fours, and each will have his own Quadrat (square).

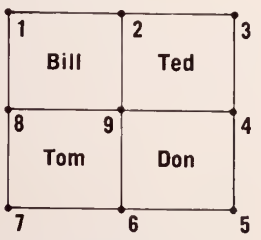
A Hammer, Nine Stakes, Sixty Feet of Twine

The first thing we'll do in the woodlot is to drive in stakes, 3 stakes to a 10-foot side, to set off the Quadrat from any surrounding area. We might represent it like this:



Now we'll take 40 feet of the twine and enclose the Quadrat beginning with stake 1, on to 2, and completely around to 1 again.

Now we'll drive stake 9 into the very center of the Quadrat and use the rest of the twine to connect stakes 2-9-6 and 8-9-4. This will give 4 areas, each containing 25 square feet. Each Ranger will get his Quadrat:



PLANTS

The Rangers will learn that the Plant Kingdom is divided into 4 great groups: Algae and Fungi; Mosses and Liverworts; Club mosses, Horsetails, Ferns; Gymnosperms, Angiosperms.

Since our woodlot is inland, we'll cross out Algae. See if you can find out why.

ANIMALS

The Rangers will learn that the Animal Kingdom is divided into about 10 great groups: One-celled animals; Sponges; Cup animals; Spiny-skinned animals; Flat worms; Round worms; Segmented worms; Mollusks; Arthropods; Chordates.

Since our Quadrats are inland, they'll draw a line through Sponges, Cup animals, and the Spiny-skinned animals. Why? Where would they be found? Where might the 1-celled animals be found?

AT WORK ON THE QUADRAT

We'll allow 3 or 4 weeks for the projects and begin by learning the plants. This should be easy for plants won't run, crawl, or hop away.

The Ranger will make a map of his Quadrat to show the location of trees, shrubs, and smaller plants. A tree might be represented as an o; a shrub, O; a dandelion, x. Each map is on a large piece of cardboard with a symbol for each individual plant growing there.

The Rangers will also keep a Quadrat Data Sheet. On this will be reported soil types: 1. Light, 2. Dark, 3. Loam, 4. Sand, 5. Clay. We'll determine the soil pH (acidity) with a soil testing kit in the Clubroom and use samples of surface soil and of soil 3 inches down.

They'll check on all forms to discover whether the plant or animal is a native or if its ancestors were imported. Many good foods like apples, cabbages, and many common pests like thistles and gypsy moths came from Europe.

KEEPING SCORE

The Rangers will watch the Quadrat for animal species as many times during the 24 hours as possible. Some may be evident only in sunshine like the butterflies; others, like the hawk moths, are active at twilight; still others, like moles and mice, move about in the dark. They'll learn to set traps. They'll discover some living things are residents and some are visitors; some, like ants and spiders, live there while others, like rabbits and owls, just wander across the Quadrat.

In the case of trees, shrubs, and larger herbs, they'll give the exact number, and when there are many small plants, they'll count the number in a square foot and multiply by the total number of square feet that the species occupies.

Their Quadrat Data Sheet might look like this:

QUADRAT DATA SHEET

Location .....
Ranger's Name .....
Period of Time From .....
to ..... (at least 3 weeks)
Soil type .....
pH at Surface .....
pH at 3 inches .....

Plant Species	No.	Native	Introduced
Red Maple (Acer *rubra*)	2	X	
Common Burdock (Arctium minus)	10		X

Animal Species	No.	Native	Introduced
Field Cricket (Acheta Assimilis)	9	X	
Preying Mantis (Mantis religiosa)	1		X

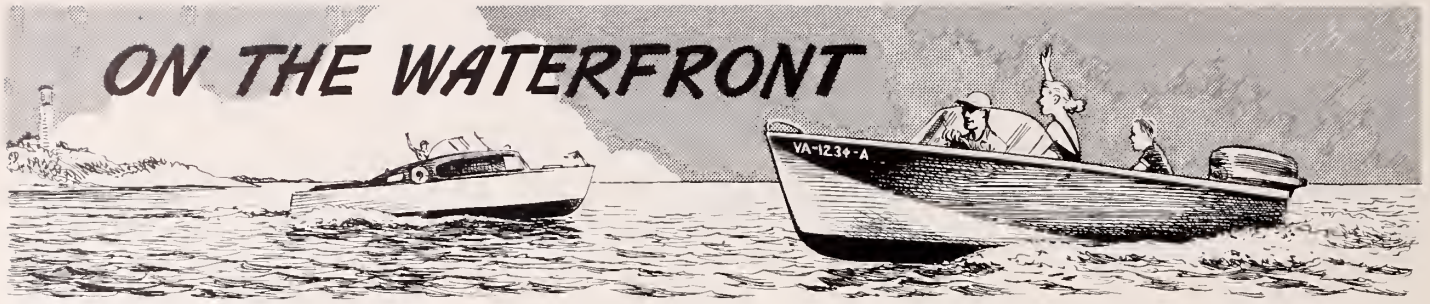
NOTEBOOK

The Rangers will take careful notes of any ecological relationships they observe, keeping a record of the date, time of day, and weather conditions at the time of the observation. Does a rabbit just hop across or does he help himself to some of the plants? If he eats vegetation, which plants does he choose? Does he pay any attention to another animal on the Quadrat? Is any spot on the Quadrat more crowded than some other area? Why? Is any spot without vegetation? Why? What animal brings about the greatest changes? Is there any evidence of competition or cooperation between or among species?

When a Ranger comes across a tiny species he doesn't know, maybe a beetle, he'll drop it into a vial of alcohol. If it's a plant, he'll press it carefully between the pages of an old book or magazine. Then he'll bring his unknowns to the reference table at the Clubhouse for identification. He'll give each a temporary title, as Unknown #1, and call it that in his Notes and on the Quadrat Data Sheet. As soon as identification is complete, the real name will take the place of the temporary number.

IDENTIFICATION AIDS

The Rangers will find these books in the Clubhouse to help them: Benton and Werner, WORKBOOK FOR FIELD BIOLOGY AND ECOLOGY; Brown, THE AMATEUR NATURALIST'S HANDBOOK; Buchsbaum, ANIMALS WITHOUT BACKBONES; Delong and Borror, INSECTS; Gates, FIELD MANUAL OF PLANT ECOLOGY; Lawson, Lewis, Burmester, Hardin, LABORATORY STUDIES IN BIOLOGY.



Edited by JIM KERRICK

Notice of Public Education Course

Flotilla 14-3, U. S. Coast Guard Auxiliary, will conduct an 8-lesson course for the public on BASIC SEAMANSHIP AND SAFE MOTORBOAT OPERATION at the following location:

Fairfax Volunteer Fire Department
4081 University Boulevard
Fairfax, Virginia

Registration and first class will be on September 15, 1970, at 7:30 p.m. Thereafter, classes will be held at 8:00 p.m. on successive Tuesday nights.

Color slides and motion picture films will be shown along with lectures on the following subjects: Maneuvering; Marlinspike Seamanship; Aids to Navigation; Charts and Compass; Rules of the Nautical Road; Legal Responsibilities; Fire Extinguishers and Fire Control; Safe Motorboat Operation.

This is the Coast Guard Auxiliary's most complete course. An attractive certificate is awarded upon successful completion. A small fee is charged to cover cost of textbooks issued and rental of fire hall.

For additional information call 703-451-3803 or 703-280-2688.

Flotillas of Hampton Roads Division V will present the following Coast Guard Auxiliary safe boating courses this fall:

Flotilla 51, of Portsmouth, Virginia.
Course: Basic Seamanship
Date: 28 September 1970
Place: Woodrow Wilson High School, Portsmouth, Va. (Time to be announced)

Flotilla 52, of Norfolk, Virginia.
Course: Basic Seamanship
Date: 15 September 1970
Time: 2000 hours
Place: Cobb's Marina, 4524 Dunning Road, Norfolk, Va.

Flotilla 54, of Norfolk, Virginia.
Course: Basic Seamanship
Date: 9 September 1970
Time: 1930 Hours
Place: City Recreation Center, 600 East Ocean View Avenue, Norfolk, Va.

Flotilla 57, of Virginia Beach, Va.
Course: Basic Seamanship
Date: About 15 September 1970
Time: 1930 Hours
Place: Flotilla 57 Home, 2198 Great Neck Road, Virginia Beach, Virginia

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Flotilla 58, of Portsmouth, Virginia.
Course: 6 Lesson Piloting Problem Course
Date: 17 September 1970
Time: 2000 Hours
Place: Recreation Hall, U. S. Coast Guard Base, First and Randolph Streets. Portsmouth, Virginia.

For further information call Portsmouth 397-8896.

18 Boating Blunders

Every year about this time various authorities begin urging safe boating practices on the public. Well intentioned and responsible boaters usually listen to the advice and try to follow it.

But what about the bad intentioned and irresponsible? Who speaks to them? Until now, no one. At least that's the opinion of the people at Mercury Outboards. So, to remedy that situation they have devised a list of 18 pieces of bad advice for that small group of boaters who have been ignoring good advice all these years.

Here are 18 "tried and true" ideas for making you the biggest menace on the water this summer (if that's your ambition):

1. Why should you bother to learn the Rules of the Road? You've been driving a boat for more than a year and you've only had those two or three little head-on collisions.

2. That stuff about sharp turns at high speeds causing boats to capsize is a lot of bunk. The Coast Guard likes to exaggerate.

3. Stop worrying about overloading. Your boat should hold eleven adults and a Great Dane with no trouble. After all, it's a dinghy.

4. My brother water-skis at night a lot and says it's a real bag. Ask him. He's standing right over there—the guy with his leg in a cast. . . .

5. Your 12-footer is a sailboat, right? He's a powerboat, right? So you have the right-of-way. Don't let an aircraft carrier intimidate you.

6. Go ahead and stand up in that canoe. How can you be expected to cast sitting down?

7. Boat cushions are for little old ladies.

8. Don't turn off a collision course until the other guy does. You can't let people push you around.

9. Sure, you could get your trailer brake lights fixed, but that would take all the adventure out of night driving.

10. Your kids don't have to wear life jackets. If they fall overboard, they can grab onto a piece of driftwood.

11. You probably remembered to put in the drain plug before you launched. That must be rain water in the bilge.

12. One-hundred horsepower isn't too much power for your 12-footer. That dealer was just trying to scare you into buying an expensive boat.

13. You don't have to get out of the way of that barge captain. Let him get out of the way. It's not his river.

14. Next time you see a water skier being towed behind another boat, drive your boat right up behind him. It's a real kick to see the look of terror on his face when he looks back at you.

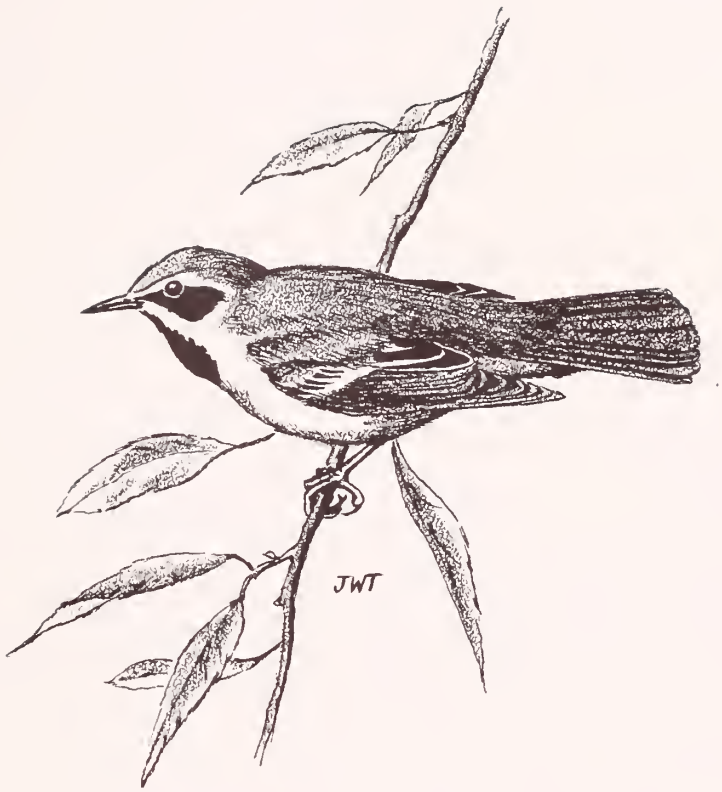
15. There may be a lot of boats around the launch area. Don't let that stop you. Come in full bore. Show 'em you're a tiger.

16. If you see a guy sitting in a fishing boat, wash him down. He'll enjoy the motion of his rocking boat.

17. Don't pay any attention to that underwater obstruction marker the Corps of Engineers put out. What do they know?

18. Why sit in the seats and get them all messed up? There are a lot of other places you can sit in a boat—like the transom, the gunwales, the back of the seats or, best of all, the bow.

Bird of the Month:



Golden-winged Warbler

By Dr. J. J. MURRAY
Lexington

THIS month we came to another handsome bird, the golden-winged warbler, which carries the scientific name of *Vermivora chrysoptera*. As Roger Tory Peterson points out in *A Field Guide to the Birds* (second revised and enlarged edition, 1947), it is the only warbler that has both yellow on the wing and black on the throat. It is one of the most beautiful members of a beautiful family.

The golden-winged is one of the larger warblers, with a wing measure of five inches, or a bit more. As its name indicates, it has a yellow patch on the wings. The forehead is also yellow. There is a black patch through the eye, and the throat is black. The eye-patch is bordered above and below by white. In the female the cheeks and throat are gray.

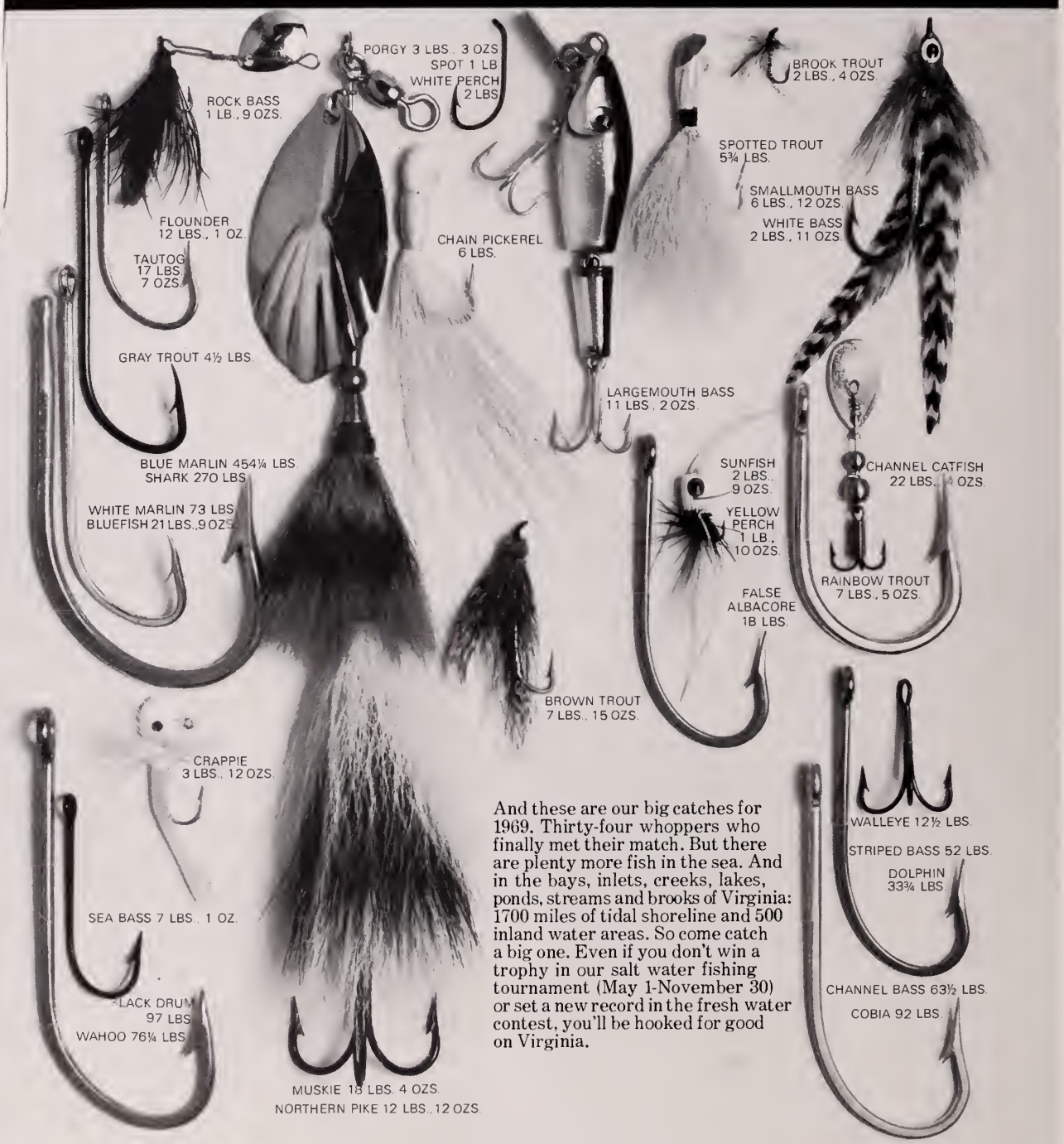
This warbler is closely related to the blue-winged warbler, so closely indeed that where their ranges touch they hybridize. There are two types of hybrids: Brewster's warbler and Lawrence's warbler. Brewster is the more common. Typical Brewster's lacks the black throat of the golden-winged warbler and the yellow underparts of the blue-winged warbler. Lawrence's warbler is yellow below, with the black throat and black patch through the eye of the golden-winged warbler.

The chosen nesting territory of the golden-winged warbler is in the brushy fields at the edge of woodlands. It seems an odd place for such a beautiful bird, but this warbler knows what it likes. The eggs, usually five in number but sometimes four or six or even seven, are lovely. They vary much in color, according to Dr. Edward Howe Forbush (*Birds of Massachusetts*, Part III, page 208), ranging from cream to white. They are marked lightly with specks that vary much in coloring.

Not much is known about the food of the golden-winged warbler, but what is known indicates that it is beneficial to man's interests. It is known that it eats the larvae of moths that are serious pests. But beneficial or not in its feeding habits, its existence is justified by its beauty.

In Virginia this warbler is a migrant through the Washington, D. C., area, although not common. It is a rare transient in the piedmont region and in most of our mountain areas. In our higher mountains it is a rare summer resident. There is a specimen in the American Museum from Elliott's Knob, July 23, 1891, which may have been an early fall migrant. Virginia records are not too common at any season. Dr. Ellison A. Smyth found a nest at Blacksburg on June 5, 1951.

In a fisherman's paradise like Virginia, there's got to be a catch.



And these are our big catches for 1969. Thirty-four whoppers who finally met their match. But there are plenty more fish in the sea. And in the bays, inlets, creeks, lakes, ponds, streams and brooks of Virginia: 1700 miles of tidal shoreline and 500 inland water areas. So come catch a big one. Even if you don't win a trophy in our salt water fishing tournament (May 1-November 30) or set a new record in the fresh water contest, you'll be hooked for good on Virginia.

Visit, write or call VIRGINIA STATE TRAVEL SERVICE, 9th & Grace Streets, Richmond 23219, phone (703) 770-4484